

Development of Wien Filter for Small Ion Gun of Analytical Equipment

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The gas cluster ion sources (GCIS) and metal ion sources were required to use ion beam at various analytical equipment, such as X-ray Photoelectron Spectroscopy (XPS) and Secondary Ion Mass Spectroscopy (SIMS). Specially, the small ion source was used for the secondary ion generation and ion etching. The Korea Basic Science Institute is developing small ion source for SIMS from last year. Our first target is the generation of argon gas cluster ion beam using GCIS which consists of cluster generator, ionizer, Wien filter, accelerator, micro lens and target. The clusters are formed using super-sonic nozzle and they insert ionizer through skimmer. The clusters in ionizer are ionized by collisions with emitted electrons and the ionized clusters are sorted using Wien filter. The design of Wien filter was completed using various calculations with initial design of GCIS. The designed Wien filter can distinguish Ar_{2500}^{+} cluster in Ar_{2400}^{+} and Ar_{2600}^{+} through 1 mm aperture. In this paper, results of feasibility studies for development of Wien filter were presented and our development plan for GCIS was introduced.